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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,686	09/12/2003	Toshihisa Hirata	A3-172 US	7373

23683 7590 03/24/2004

MOLEX INCORPORATED
2222 WELLINGTON COURT
LISLE, IL 60532

EXAMINER	
GILMAN, ALEXANDER	
ART UNIT	**PAPER NUMBER**
2833	

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,686	HIRATA ET AL.	
	Examiner	Art Unit	
	Alexander D Gilman	2833	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-14* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/12/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 4 is objected to because of the following informalities:

Claims 4, line 4. It should be –so-- instead of "is"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3, 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3, lines 1-2) recites "tail portion of said first terminal is at a distal end of the mounting portion".

It is unclear, which of the ends of the mounting portion is considered as a "distant end"

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Olson.

With regard to claim 1, Olson (US 5,599,192) discloses a board-to board electrical connector assembly for effecting a connection betweentwo circuit boards, comprising:

a first connector (110) having a dielectric housing for mounting on a first circuit board;

a plurality of first terminals (118) mounted on the dielectric housing and each terminal including a tail portion for connection to an appropriate circuit trace on the first circuit board and a convex contact portion (150) defining a continuous arcuate contact surface;
a second connector (112) having a dielectric housing for mounting on a second circuit board;
a plurality of second terminals (130) mounted on the dielectric housing of the second connector and each second terminal including a tail portion for connection to an appropriate circuit trace on the second circuit board and a contact projection for sliding over the continuous arcuate contact surface of the convex contact portion of said first terminals upon mating of the connectors; and whereby initial engagement of the contact projection of each second terminal with the convex contact portion of a respective one of the first terminals is at minimal engaging forces which increase as the contact projection slides over the convex contact portion and then decreases to allow the connectors to mate and the circuit boards to come together with minimal mating forces at a mated condition of the connectors.

2. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al.

With regard to claim 1, Nakamura et al (US 5,224,866) disclose (Fig. 6-8) a board-to board electrical connector assembly for effecting a connection between two circuit boards, comprising:
a first connector (40) having a dielectric housing for mounting on a first circuit board;

a plurality of first terminals (43) mounted on the dielectric housing and each terminal including a tail portion for connection to an appropriate circuit trace on the first circuit board and a convex contact portion (43b) defining a continuous arcuate contact surface;
a second connector (50) having a dielectric housing for mounting on a second circuit board;
a plurality of second terminals (56) mounted on the dielectric housing of the second connector and each second terminal including a tail portion (56b) for connection to an appropriate circuit trace on the second circuit board and a contact projection (56a) for sliding over the continuous

arcuate contact surface of the convex contact portion of said first terminals upon mating of the connectors; and

whereby initial engagement of the contact projection of each second terminal with the convex contact portion of a respective one of the first terminals is at minimal engaging forces which increase as the contact projection slides over the convex contact portion and then decreases to allow the connectors to mate and the circuit boards to come together with minimal mating forces at a mated condition of the connectors.

With regard to claim 2, Nakamura et al disclose that said first terminals (43) are generally U-shaped with each first terminal having one leg of the U-shape defining (being characterized, distinguished by) said convex contact portion (43b) and the other leg of the U-shape defining a mounting portion for

mounting the first terminal in the dielectric housing of the first connector.

With regard to claim 3, as it can be understood due to the 112 problem, Nakamura et al disclose that the tail portion of said first terminal is at a distal end of the mounting portion of the first terminal.

With regard to claim 4, Nakamura et al disclose that the housing of said first connector has an open space (45) between the convex contact portion and the mounting portion of a respective one of first terminals so that the convex contact portion is free to flex upon engagement with the second terminal of the second connector.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent Abstract of Japan, Pub # 2000260509 in view of Olson.

With regard to claim 1, Patent Abstract of Japan, Pub # 2000260509 discloses a board-to board electrical connector assembly for effecting a connection between two circuit boards, comprising: a first connector (100) having a dielectric housing for mounting on a first circuit board;

a plurality of first terminals (120) mounted on the dielectric housing and each terminal including a tail portion for connection to an appropriate circuit trace on the first circuit board ;
a second connector (112) having a dielectric housing for mounting on a second circuit board;
a plurality of second terminals (130) mounted on the dielectric housing of the second connector and each second terminal including a tail portion for connection to an appropriate circuit trace on the second circuit board and a contact projection for sliding over the continuous arcuate contact surface of the convex contact portion of said first terminals upon mating of the connectors; and Patent Abstract of Japan, Pub # 2000260509 does not disclose a convex contact portion defining a continuous arcuate contact surface.

Olson discloses a convex contact portion defining a continuous arcuate contact surface (150). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the fist terminal in Patent Abstract of Japan, Pub # 2000260509 with continuous arcuate contact surface as taught by Olson, to increase the withdrawal force without increasing the insertion force (Olson, Abstract).

With regard to claim 2, Patent Abstract of Japan, Pub # 2000260509 when modified by Olson, discloses (Patent Abstract of Japan, Pub # 2000260509) that said first terminals (43) are generally U-shaped with each first terminal having one leg of the U-shape defining (being characterized, distinguished by) said convex contact portion (Olson -150) and the other leg of the U-shape defining (Patent Abstract of Japan, Pub # 2000260509) a mounting portion for mounting the first terminal in the dielectric housing of the first connector.

With regard to claim 3, as it can be understood due to the 112 problem, Patent Abstract of Japan, Pub # 2000260509 when modified by Olson, discloses that the tail portion (120a) of said first terminal is at a distal end of the mounting portion of the first terminal.

With regard to claim 4, Okura when modified by Olson, discloses that that the housing of said first connector has an open space (Okura, Fig. 5) discloses that between the convex contact portion (when modified) and the mounting portion of a respective one of first terminals so that the convex contact portion is free to flex upon engagement with the second terminal of the second connector.

With regard to claim 5, Patent Abstract of Japan, Pub # 2000260509 when modified by Olson, discloses (Patent Abstract of Japan, Pub # 2000260509) that contact projection (225) of each second terminal is at the distal end of a flexible contact arm.

2. Claims 1- 6, 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okura in view of Olson.

With regard to claim 1, Okura (US 5,976,916) discloses a board-to board electrical connector assembly for effecting a connection between two circuit boards, comprising:

a first connector (30) having a dielectric housing for mounting on a first circuit board;

a plurality of first terminals (40) mounted on the dielectric housing and each terminal including a tail portion for connection to an appropriate circuit trace on the first circuit board ;

a second connector (10) having a dielectric housing for mounting on a second circuit board;

a plurality of second terminals (20) mounted on the dielectric housing of the second connector and each second terminal including a tail portion for connection to an appropriate circuit trace on the second circuit board and a contact projection for sliding over the continuous arcuate contact surface of the convex contact portion of said first terminals upon mating of the connectors; and

Okura does not disclose a convex contact portion defining a continuous arcuate contact surface.

Olson discloses a convex contact portion defining a continuous arcuate contact surface (150).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the fist terminal in Okura with continuous arcuate contact surface as taught by Olson, to increase the withdrawal force without increasing the insertion force (Olson, Abstract).

With regard to claims 2, 10, Okura when modified by Olson, discloses (Olson) that said first terminals (40) are generally U-shaped with each first terminal having one leg of the U-shape defining (being characterized, distinguished by) said convex contact portion (Olson -150) and the other leg of the U-shape defining (Okura, Fig. 5)) a mounting portion for mounting the first terminal in the dielectric housing of the first connector.

With regard to claim 3, 11, as it can be understood due to the 112 problem, Okura when modified by Olson, discloses (Okura) that the tail portion (41) of said first terminal is at a distal end of the mounting portion of the first terminal.

With regard to claim 4,12, Okura when modified by Olson, discloses that that the housing of said first connector has an open space (Okura Fig. 5) discloses that between the convex contact portion (when modified) and the mounting portion of a respective one of first terminals so that the convex contact portion is free to flex upon engagement with the second terminal of the second connector.

With regard to claim 5, Okura when modified by Olson, discloses (Okura, Fig. 4) that contact projection (25) of each second terminal is at the distal end of a flexible contact arm (24).

With regard to claims 6, 10 Okura when modified by Olson, discloses (Okura) that said flexible contact arm comprises (Fig. 4) one leg of a U-shaped contact section of the second terminal.

With regard to claims 8, 9, 13, 14 Okura when modified by Olson, discloses (Okura, Fig. 4) that said U-shaped contact section of each second terminal is connected (with 22) to a mounting section (26) for mounting the second terminal in the dielectric housing of the second connector and the tail portion (21) of each second terminal projects from the mounting section thereof.

Allowable Subject Matter

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

No prior art has been found to anticipate or render obvious the presently claimed subject matter. Specifically, none of the prior art of record discloses the combination of the limitations presented including the plug portion of the first connector's housing being mateable in the U-shaped contact section of the second terminals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander D Gilman whose telephone number is 571 272-2004. The examiner can normally be reached on Monday-Friday, 10:30 a.m. - 8:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571 272-2800 ext. 33. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

03/17/2004

Alex Gilman

ALEXANDER GILMAN
PRIMARY EXAMINER